



Overview of Presentation

- **Financing Concerns**
- **Financial Analysis**
- **Reputational Risk Analysis**
- **Concluding Thoughts**

Financing Concerns



Nuclear Financing Concerns & Types of Risk

- **Primary Concerns for Financiers**

- Long development / construction periods
- High capital costs
- Regulatory uncertainty
- Reputational Risk
 - Safety culture
 - Environmental responsibility
 - Commitment to International Regimes and Standards
- First-of-a-kind risk
- Operational Success
- Human Resources and Supply Chain
- Sustainability of government commitment
- Fuel cycle concerns

- **Key Risks in an NPP**

- Completion
- Political
- Country
- Regulatory / Licensing
- Technology
- Labor & Materials
- Electricity Market
- Operational
- Environmental
- Nuclear Incident
- Reputational

Lenders consider the quality of the Project Team

- Has the technology been built?
- How much of a track record is there for the technology?
- Who are the suppliers and contractors?
 - What have they done?
 - Who is their project team?
 - What is their capacity?
- Who is the operator?
 - Is the operator experienced?
- Who is the developer / owner?
 - What experience does the developer have in putting together this type of project?
 - What is the strength of the balance sheet?
 - Is there a sovereign guarantee?
 - Does it have a financial / economic model that works?

Lenders consider the quality of the Project

- Is there a history of nuclear power in the country or is the first NPP?
- Is there public support for nuclear power in the country?
- Is the government commitment sustainable?
- Is the project economically viable?
- Is the country committed to international best practices?
- Is the host country nuclear regulator capable?

The background image shows a blurred office scene with two men in suits standing by a large window. In the foreground, a desk is visible with a pen and a colorful bar chart. A semi-transparent red banner is overlaid on the middle of the image, containing the text 'Financial Analysis'.

Financial Analysis

Improving the Prospects of Financing Nuclear Power Projects

- Nuclear vs. Other Major Infrastructure Projects
 - Nuclear projects share many similar risks with other large infrastructure projects (high cost, long construction period, etc.)
 - BUT: How such risks are “scored” might still be very different
 - Nuclear projects do have “unique” risks (fuel cycle, NPT, cross-border damage, “emotional” issue, etc.)

Speaking of Risk ...

- One of the principles of Project Finance is ...

The risk should be borne by the party in the best position to manage the risk.

Consider: Is this statement fully applicable to a nuclear power project?

- But in a financing / project development context, important to consider incremental costs to the project:

What is the “risk premium” associated with the assumption of risk by supplier, contractor, or offtaker?

Who bears the risk if the key project participants got it wrong?

For lenders, the key question is: Have all the risks been addressed and allocated among the key project participants?

Financeability Considerations

1. Even though there has never been an NPP that has been project financed, Lenders will still diligence the overall project, using project finance principles
2. Lenders will want to know that the project cost and project schedule are achievable
3. Lenders will want to see that the Owner has the capability to manage the project
4. Lenders will want to see demonstrated operator capability
5. Lenders will want to see regulator capability
6. Lenders will want either a viable project, from a technical and economic perspective, or they will want a sovereign credit
 - a. In either case, REPUTATIONAL RISK considerations will still be of paramount importance
 - b. Consequently, the Lenders will care very much about who holds the “keys to the car”
7. Financing options increase after commercial operation; therefore, a proper financing plan considers both construction period and operating period structures

Can the Project be Financed?

- Solid economic rationale for the project
 - Dedicated electricity source / baseload principles
 - Long-term PPA
 - Balance sheet financing (perhaps)
 - Sovereign guarantee (perhaps)
 - Quantifiable cost model
 - Verifiable delivery model
 - Delivery team with proven track record
- ***The project must have a believable financial model***
- *Simply put: Where is the money in the deal?*
 - *Where is the money behind the deal?*
 - *How does money come from the deal?*
 - *Are there other considerations that override the first two factors?*
 - *If other considerations matter, how can the risk allocation be reconfigured in such a manner that still supports external financing?*
- *Likely sources:*
 - *ECA financing*
 - *Government-to-Government financing*
 - *Host government support (guarantees, PPAs, financing; both program and project support)*
 - *Vendor equity*
 - *And, maybe, balance sheet deals*



Reputational Risk Analysis

Financing a Nuclear Power Project

- Financing an NPP has historically been one of the biggest challenges for NPP development
 - NPP financing involves unique risks, large sums, and limited sources of funds
- *Note that both Export Credit Agencies and Commercial Banks have internal lending policies that specifically address Reputational Risk considerations*
- Even though it might not be a “project financed” transaction, reputational concerns will necessitate a robust reporting and covenant package, applying project finance discipline to the project review process
 - Environmental & Social Considerations
 - Equator Principles
 - IFC & OECD Environmental Guidelines
 - International Nuclear Obligations
 - Nuclear Liability (both International Treaties and Domestic Law)
 - The 3Ss of Safety / Security / Safeguards
 - Bilateral agreements
 - Confidence in the Host Country Regulator
 - Importance of technical due diligence on the project

Lending Decisions:

What do financial institutions really care about?

- Conclusion: **REPUTATIONAL RISK** analysis is as important to financial institutions as the commercial analysis.

1. *Will I get paid back? How will I get paid back?*

2. *Is this a “good project”?*

Both are equally important!

Key Principles for International Deployment

- Safety
 - Safe operation of civilian nuclear power facilities
- Security
 - Physical protection
- Safeguards
 - Non-proliferation
- Note that the nuclear industry is unique in its cooperation and regulation
 - But, remember, too, that the IAEA provides guidance on technology; the IAEA does not make law regarding civilian nuclear power, leaving such certifications to national regulatory authorities ...
 - ... Which means that the **host country regulator** is very important and must be capable !

Capability of the Nuclear Regulator

- Key Questions:
 - Does the host country have a competent regulator in terms of both ***experience and technology-specific knowledge***?
 - Is the regulator independent?
 - Does it have the requisite authority to act?
 - Will it take action when appropriate?
 - Will limitations be imposed as to technology type (e.g., PWR, BWR, HWR) and generation level (e.g., only Gen III and Gen III+)?
- The regulatory body must:
 - Have adequate legal authority, **technical & managerial competence**, and human & financial resources to fulfill its responsibilities
 - Be able to demonstrate **nuclear regulatory experience**
- Note that regulatory **capability** is a key consideration for financing entities
 - The regulator needs to be the “adult in the room” that watches over the project during both construction and operation
 - Challenge for financing entities: assessing regulatory competence

International Nuclear Agreements and Sustainability Considerations

- Why are International Nuclear Agreements and Sustainability Considerations important?
 - Confidence-building measures for the international community
 - Demonstrating that it is a “good project”
 - **Reputational Risk** for project participants
 - **Reputational Risk** for lenders and investors
 - Compliance with “prudent industry practice” / international standards
 - Post-Fukushima scrutiny for nuclear projects
- ❖ *Reputational Risk is a very real consideration in NPP development, especially for financial institutions.*
- What does “prudent industry practice” mean?
 - “**Prudent Industry Practice**” means the standards, practices, methods and procedures consistent with that degree of skill, diligence, judgment, prudence and foresight which would ordinarily be expected from an international skilled and experienced owner, contractor, equipment manufacturer or, as the case may be, operator, engaged in designing, engineering, constructing, developing, commissioning, repairing, refurbishing, operating, insuring, maintaining and/or decommissioning a nuclear power plant, in each case taking into account and giving appropriate consideration to all applicable standards and guidelines and local conditions.

Relevance of the IAEA

- Banks love to say, *“Does the project comply with IAEA guidelines and standards?”*
 - The challenge is that this condition, is nebulous, recognizing that IAEA pronouncements in the area of NPP development are not laws, they might not be applicable in all cases, they evolve over time, and the body of IAEA work is too extensive to assess against a particular project.
 - Project participants, lenders, and their technical and legal advisory teams will need to establish a meaningful set of evaluation criteria vis-à-vis the IAEA’s body of guidance and other applicable benchmarks in order to reach a concrete understanding on how such standards will be applied to the NPP and the consequences for non-compliance therewith
- Importance of IAEA reviews of the program and the project:
 - INIR review (Integrated Nuclear Infrastructure Review)
 - IRRS review (Integrated Regulatory Review Service)
 - Pre-OSART and OSART reviews (Operational Safety Review Team)

International Nuclear Agreements

- **Nuclear Liability**

- Vienna Convention (1997 Amendments)
- Paris Convention
- Brussels Supplementary Convention
- Joint Protocol
- Convention on Supplementary Compensation

- **Safety**

- Convention on Nuclear Safety
- Convention on Early Notification of a Nuclear Accident
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

❖ **Note the importance of bilateral agreements**

❖ **Note the importance of a national policy statement that is publicly available**

- **Security**

- Convention on the Physical Protection of Nuclear Material (and the Amendment to the same)
- International Convention for the Suppression of Acts of Nuclear Terrorism

- **Safeguards**

- UN Treaty on Non-Proliferation of Nuclear Weapons
- Safeguards Agreement with IAEA (and host country)
- Additional Protocol with IAEA (and host country)
- UN Comprehensive Test Ban Treaty
- Nuclear Suppliers' Group Guidelines

Sustainability Standards

- **Sustainability**

- Sustainability considerations have risen in importance to the financial community, and lenders will want to see that compliance with local environmental laws and international standards (the aforementioned Equator Principles and IFC guidelines) is observed.
- Such matters will necessarily bring project lifecycle considerations to the lenders' analysis of the project, as lenders will look to see that the NPP planning includes a spent fuel / nuclear waste plan and a decommissioning plan, demonstrating the lenders' desire to look beyond the tenor of the debt.
- Sustainability, in particular, is a combination of both art and science, where, oftentimes, there is no clear solution that is measurable and quantifiable; instead, the compliance plan can be qualitative, not quantitative, and, thus, much more difficult to resolve.

Environmental, Safety, and Social Guidelines

- **Equator Principles**

- The Equator Principles are a credit risk management framework for determining, assessing and managing environmental and social risk in project finance transactions.

- **International Finance Corporation's Performance Standards on Social and Environmental Sustainability dated 30 April 2006 and the IFC Environmental Health and Safety Guidelines**

- The World Bank Group Environmental, Health and Safety Guidelines ("EHS Guidelines") are technical reference documents with general and industry-specific examples of Good International Industry Practice, as defined in the International Finance Corporation's Standard 3 on Pollution Prevent and Abatements.

- **Council Recommendation on Common Approaches on the Environment and Officially supported Export Credits adopted by the OECD Counsel on 12 July 2007**

- The OECD's Revised Council Recommendations on Common Approaches on the Environment and Officially Supported Export Credits ("OECD Export Credits and Credit Guarantees Recommendations") are a set of recommended common approaches for OECD member states with respect to addressing environmental issues relating to exports of capital goods and services and the locations to which these are destined.

- **ECA-specific environmental and social guidelines; Commercial Bank lending guidelines**
- **Espoo and Aarhus Conventions**

Concluding Thoughts



For the Country, does Nuclear Power make sense?

- Does the country have:
 - the institutional capability to support NPP development?
 - the financial resources to support NPP development?
 - the human resources to support NPP development?
 - the infrastructure to support NPP development?
 - the international treaty commitments in line with international best practices?
- ***And if it does not, has the country developed a realistic plan of how to get “there” and close those gaps?***
- Does nuclear power support energy security and/or energy diversity considerations for the country?
- Does the country expect the NPP to compete on the market against other forms of power generation?
- Has the case been made with the public to “go nuclear”?

Key Question: What are my policy goals?

IF:

- one believes that nuclear power should be part of the national energy portfolio ...
- commercial banks are not willing to take “uncovered” nuclear project risk and financial markets are constrained ...
- nuclear power projects are not “winning” short term propositions from corporations whose results are driven by quarterly and annual statements ...
- the “market” is not driving the desired result ...
- host governments, in many cases, lack adequate resources to develop nuclear programs and nuclear projects ...
- financing packages are becoming key elements, if not differentiators, in bid submissions ...

THEN:

- Government can step in to shape the result to achieve the “greater good”
- Governments can take the long term view

THEREFORE:

- Government needs to employ a number of tools to achieve that goal
- Financial tools address the greatest challenge to nuclear power plant development
- Recognize, too, that, **globally**, NPP development is **government-driven** in today’s market

Thank you for your time and attention

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Paul Murphy's practice focuses on multiple aspects of the nuclear industry – from legal and policy matters, including international regulatory and treaty frameworks and issues regarding nuclear liability, to strategies for creating viable nuclear power programs and the identification and mitigation of associated risks – representing developers/owners, investors, and contractors on nuclear projects internationally. Mr. Murphy is recognized as an expert in the development and financing of nuclear power programs by the International Atomic Energy Agency (IAEA), the OECD's Nuclear Energy Agency (NEA) and the US government. Mr. Murphy currently serves on the IAEA's Technical Cooperation Program team, which assists member states in developing civilian nuclear power programs. Mr. Murphy has served as a designated expert, chairman, and author at several special meetings and for multiple working groups of the IAEA, primarily involving the development, financing, and structuring of nuclear power projects. He continues to work with the IAEA in a number of key areas, including a current revision of the IAEA's *Handbook on Nuclear Law* and as lead author for a new report to be released in the next few months, entitled, *"Alternative Contracting and Ownership Practices for Nuclear Power Plants"*.

Mr. Murphy currently serves as a two-time appointee to the US Secretary of Commerce's Civilian Nuclear Trade Advisory Committee, and he has served as chair of its Finance subcommittee. In addition, Mr. Murphy recently served as the US Government's sole representative on an NEA working group on *"Financing of Nuclear Power Plants"*, acting as chairman for the working group. Mr. Murphy also chaired the IAEA working group that issued, *"Issues to Improve the Prospects of Financing Nuclear Power Projects."* Mr. Murphy has also worked with the Nuclear Energy Institute, the US State Department, the US Mission to the OECD, and the Export-Import Bank of the United States on revisions to the OECD's Guidelines for the financing of nuclear power projects by Export Credit Agencies.

For the last five years, Mr. Murphy served as a faculty member for the *"Training Course on Nuclear Power Infrastructure Programs and Related Projects in Emerging Nuclear States"*, held on behalf of the US State Department and the IAEA at the Argonne National Laboratory and attended by representatives of over 20 foreign governments. Mr. Murphy was the lead instructor for the segments on financing and the bidding / evaluation process for nuclear power projects.

In addition to his work in the nuclear sector, Mr. Murphy's representations have included extensive work in the engineering and construction industry, where he has been heavily involved in the nuclear and fossil power sectors, both domestically and internationally. His project experience, both domestic and international, includes nuclear (new build, steam generator replacement, nuclear operating plant services), coal (both new build and environmental retrofit), and gas-fired power projects, ranging from EPC contracting structures to technical support agreements and including major equipment purchase agreements and subcontracting. Recent projects have included work in solar power projects (CSP), IGCC and coal liquefaction plants, and pipelines.

Prior to joining Milbank, he served as Senior Counsel for Bechtel Power Corporation, supporting both the Nuclear and Fossil business lines as a transactional attorney involved in bid evaluations, business development, proposal submittals, contract negotiations, procurement, and project execution.

Mr. Murphy is a graduate of Princeton University's Woodrow Wilson School for Public and International Affairs and a graduate of Harvard Law School. Mr. Murphy is also a member of the International Nuclear Law Association.

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